Meilhaus Electronic User Manual
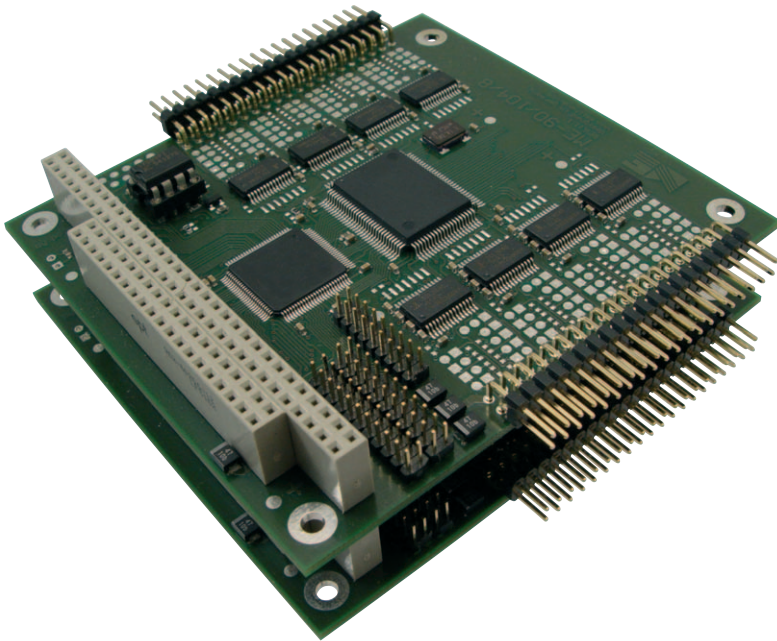
ME-90 PC/104 2.2E

**Embedded PC/104 RS232 and/or RS422/485
Interface Board with 8 Ports**

Imprint

User Manual ME-90 PC/104

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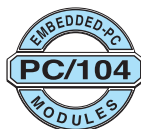82178 Puchheim/Germany

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Contents

1   Introduction

Dear customer,
Thank you for purchasing the ME-90 PC board! On purchase of this board you have selected a high-quality technological product that left our premises in perfect condition.

Please check that your delivery is complete and in good condition. If any faults are obvious, please contact us immediately.

We recommend that you carefully read this manual before installing the board - especially the installation chapter. This also explains how the jumpers can be set for the various board functions.

1.1   Scope of Delivery

It goes without saying that we make every effort to ensure that the product package is complete. But to check whether your delivery is complete, please check your package using the following list.
Your package should contain the following parts:
• RS232 or RS422/485 interface board, ME-90 PC/104 type, for the ISA-based embedded-PC/104PCI form factor.
• Manual in pdf file format on the ME-Power CD (optional printed version).
• 2x ribbon cables on each 4x 9-pin sub-D connector.
• Molex mating connector for interrupt (external).

1.2   Features

Model Overview

Model	Ports	Type	Rate[1]	Bus
ME-90/8 RS232 PC/104	8	RS232	921.6 kBd	PC/104
ME-90/8 RS485 PC/104	8	RS422 or RS485 selectable by jumper	921.6 kBd	PC/104
ME-90/8 MIX PC/104	8	4x RS232, 4x RS422 or RS485 selectable by jumper	921.6 kBd	PC/104

The ME-90 embedded interface provides **8 ports** on a board in the ISA-based **PC/104** form factor. These ports can be all **RS232**, all **RS422/RS485** or **mixed** (half-half). The transmission rate is approx. 1 MBd max. (varies with system[1]). With its **extended temperature range**, **ESD protection** and an additional, external interrupt input, the ME-90 is the ideal solution for points-of-sale, retail and industrial data transfers.

- 8 ports, including ribbon cable on 8x 9-pin sub-D connectors.
- Transmission rates up to 1 MBd (varies with system1)).
- RS232 or RS422/RS485 or mixed ports (half-half).
  RS422 or RS485 selectable by jumper
- RS422/RS485: Termination can be set with jumpers. RS485 transmission control with RTS or DTR half duplex or auto switch.
- All RS232 handshake lines wired to the connectors. Additional 5V pin per port.
- Large address range (base address can be set with jumpers).
- Additional interrupt input/interrupt (external).
- Extended temperature range -40...+85°C.
- ESD protection (protection to withstand electrostatic discharge).
- For the ISA-based PC/104 form factor.
- Works as standard COM ports under Windows, Linux and others. No special driver required.

1.3   System Requirements

The ME-90 will be used with a PC/104 stack with Intel® processor or compatible.

1.4   Available Software

The ME-90 works as standard COM port under Windows, Linux, and others. There is no need to install a special driver software.

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1) Max. possible rate with the hardware. Actual rate depends on ISA bus and system

2   Installation

When installing the board in a PC/104 stack do not use inappropriate force. It should be possible to insert the board into other PC/104 modules without a great deal of effort. Please note the relevant regulations of the PC/104 standard for assembly.

Caution!

Risk of destroying highly sensitive components through electrostatic discharge! Therefore, make sure you dissipate your body's charge before installing the board, for example, by touching a blank casing element on your computer.

3   Hardware

3.1   Jumper Positions

Figure 1 shows the jumper positions. They are referred to as ST1 to ST69.
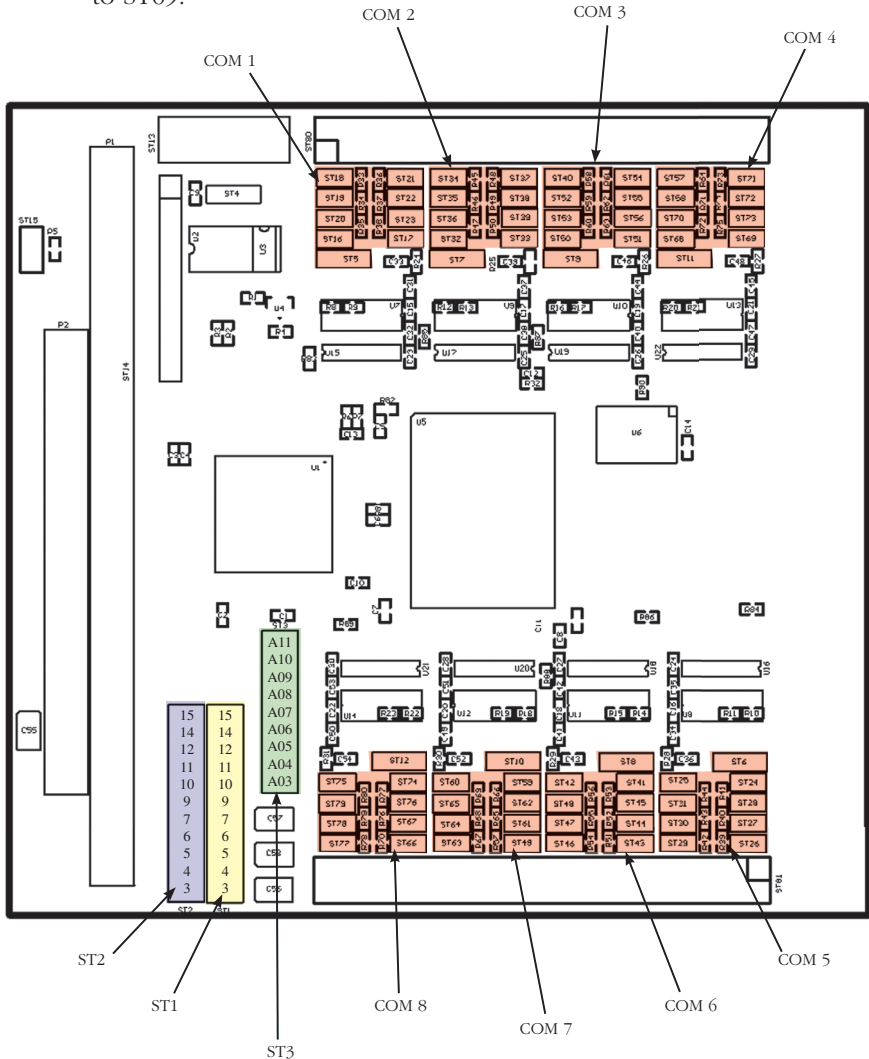

Figure 1: Jumper positions:

3.2   Jumper Functions

3.2.1   Interrupts - UART and external

The UART interrupt is set with jumper ST1, and the external interrupt with ST2 . IRQ 3 - 7, 9 - 12, 14, 15 (Figure 2a) can be set. Factory setting: IRQ for external: 5. IRQ UART: 10. In the example in Figure 2b the following are set: IRQ 9 for external, IRQ 10 for the UART.
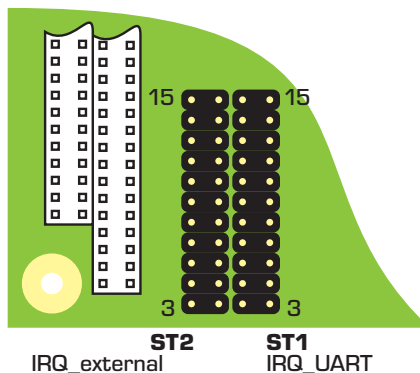

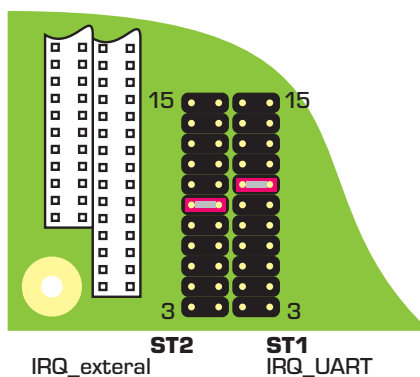*Figure 2a: Jumper ST1 and ST2 for the interrupt settings*

Figure 2b: Example - Settings of IRQ 9 for external, IRQ 10 for the UART

3.2.2   Base address

The board's **base address** is set with jumper **ST3** (**Figure 3a**). The jumpers are assigned to the address lines as shown in **Figure 4**. „1" means a set jumper. By default the address 608 hex is set. In the example in Figure 3b 700 hex is set:
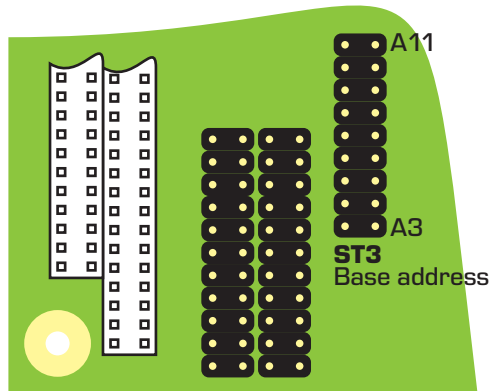

Figure 3a: ST3 jumper for the address setting
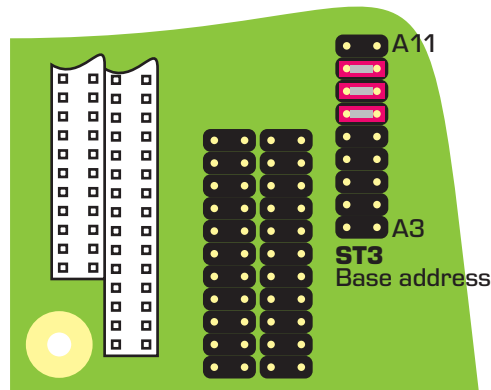
Figure 3b: Example - 700 hex address is set

A19	A18	A17	A16	A15	A14	A13	A12	A11	A10	A9	A8	A7	A6	A5	A4	A3	A2	A1	A0
0	0	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0

=> 11100000000 => 700 Hex

Figure 4: Jumper assignment to the address lines

3.2.3   **Termination, RTS/DTR and RS422/RS485 selection**

These settings are made for the **8 ports individually** with 8 jumper groups that are always arranged the same. The assignment of the jumper groups to the ports is shown in **Figure 1**. **Figure 5a** shows the functions of the jumpers. **DTR/RTS** is selected with the triple jumper below. In the example in **Figure 5b** RTS is set. The **termination** is set for In (above the triple jumper) and Out using the three upper jumpers (pull-up, pull-down, differential, none settings). No jumper is set in the example in **Figure 5b** and therefore no termination. RS422 (open) or RS485 (inserted) is selected directly with the jumpers above the triple jumper.
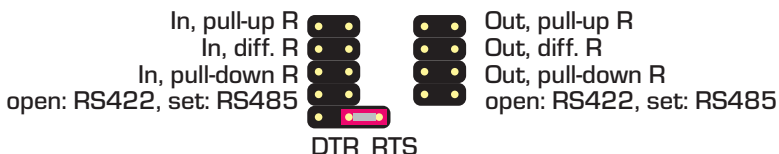

Figure 5a: Jumpers for setting the RS422/RS485 modes

Figure 5b: Example - RTS selected, no termination, RS422 mode

Appendix

A   Specifications

PC/104 interface

Bus interface	ISA-16-bit based PC/104-embedded bus
Base address	Can be set with jumpers in a wide range; the A3…A11 address lines are wired to jumpers.
Interrupt	2 IRQs: IRQ of the UART and external interrupt input, both individually selectable by jumper 3…7, 9…12, 14, 15

Data transfer

Ports	ME-90/8 RS232 PC/104: 8x RS232 ME-90/8 RS485 PC/104: 8x RS422 or RS485 (selectable by jumper) ME-90/8 MIX PC/104: 4x RS232 and 4x RS422 or RS485 (selectable by jumper)
Interface type	RS232 with handshake RS422, RS485, termination (pull-up, pull-down (100 Ω), differential, none) is jumper-selectable per port. RS485 transmission control with RTS or DTR (jumper-selectable per port) half duplex or auto switch.
Baud rate	75/110/134/150/300/600/1200/1800/2400/ 4800/7200/9600/14,400/19,200/38,400/ 57,600/115,200/128,000/230,400/460,800/ 921,600 baud[1]
Transmission	Data bits: 4…8 Parity: None, Odd, Even, Mark, Space Stop bits: 1, 1.5 or 2 Protocol: Xon/Xoff, Hardware, None

| UART type, FIFO | 4x XR16L788 Quad UART or compatibles; register-compatible with the 16550 with integrated 64-byte transmit and receive FIFOs per port |

General Specifications

Current consumption	Up to 1A max./typically 480mA
Dimensions	(mm) 90 x 96 (board only), 105 x 96 x 24 (board including connectors)
Connectors	PC/104 bus connector and 2x pin field including 2x ribbon cables, each with 4x 9-pin D-sub connectors. Each port has an additional 5V pin. 10-pole Molex connector for interrupt (external) (Molex mating connector included in delivery)
ESD protection	Up to 15kV (IEC 1000)
Temperature range	-40…+85°C
Humidity	20…55% (none condensing)

CE Certification

EC directive	89/336/EMC
Emission	EN 55022
Immunity	EN 50082-2

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1) Max. possible rate with the hardware. Actual rate depends on ISA bus and system.

B   Connector Pinouts

B1   Position of pin field/connectors
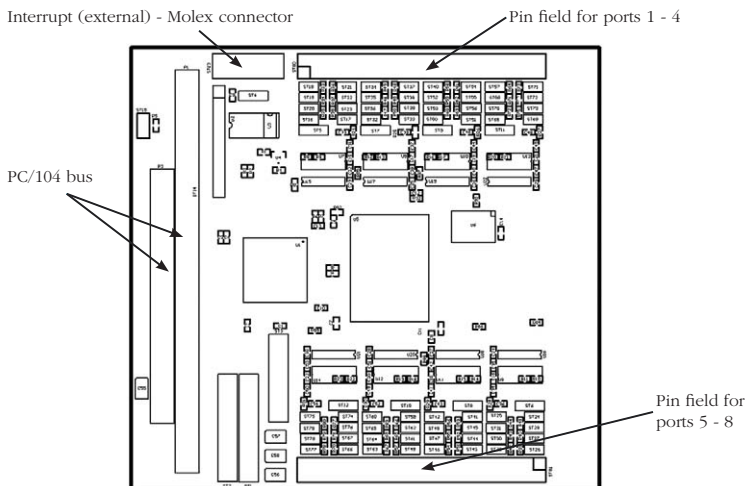
Interrupt (external) - Molex connector   Pin field for ports 1 - 4

PC/104 bus

Pin field for
ports 5 - 8

Figure 6: Position of pin fields/connectors on the ME-90

B2   Molex connector - interrupt (external)

1 2 3 4 5 6 7 8 9 10

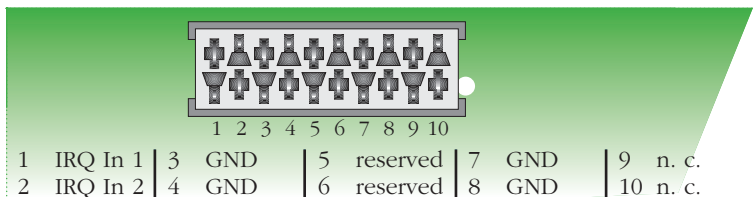| 1	IRQ In 1	3	GND	5	reserved	7	GND	9	n. c.
2	IRQ In 2	4	GND	6	reserved	8	GND	10	n. c.

*Figure 7: Assignment of Molex connector (Molex mating connector
included in delivery)*

B3   Assignment of pin fields for the ports

The two pin fields for ports 1 - 4 and 5 - 8 are assigned identically;
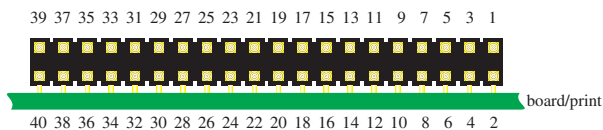refer to Figure 7 and the table below:

39 37 35 33 31 29 27 25 23 21 19 17 15 13 11 9 7 5 3 1

board/print

40 38 36 34 32 30 28 26 24 22 20 18 16 14 12 10 8 6 4 2

Figure 8: 40-pole pin field of ME-90, front view

| Pin	Port	RS232	Direction	RS422/485	Direction
1	1 or 5	DCD	Input	RxD+	Input
2	1 or 5	DSR	Input	reserved	Input
3	1 or 5	RxD	Input	RxD-	Input
4	1 or 5	RTS	Output	reserved	Output
5	1 or 5	TxD	Output	TxD+	Output
6	1 or 5	CTS	Input	reserved	Input
7	1 or 5	DTR	Output	TxD-	Output
8	1 or 5	RI	Input	reserved	Output
9	1 or 5	SGND	Signal GND	SR	Signal reference
10	1 or 5	5 V	5 V pin	5 V	5 V pin
11	2 or 6	DCD	Input	RxD+	Input
12	2 or 6	DSR	Input	reserved	Input
13	2 or 6	RxD	Input	RxD-	Input
14	2 or 6	RTS	Output	reserved	Output
15	2 or 6	TxD	Output	TxD+	Output
16	2 or 6	CTS	Input	reserved	Input
17	2 or 6	DTR	Output	TxD-	Output
18	2 or 6	RI	Input	reserved	Output
19	2 or 6	SGND	Signal GND	SR	Signal reference
20	2 or 6	5 V	5 V pin	5 V	5 V pin
21	3 or 7	DCD	Input	RxD+	Input
22	3 or 7	DSR	Input	reserved	Input
23	3 or 7	RxD	Input	RxD-	Input
24	3 or 7	RTS	Output	reserved	Output
25	3 or 7	TxD	Output	TxD+	Output
26	3 or 7	CTS	Input	reserved	Input
27	3 or 7	DTR	Output	TxD-	Output
28	3 or 7	RI	Input	reserved	Output
29	3 or 7	SGND	Signal GND	SR	Signal reference
30	3 or 7	5 V	5 V pin	5 V	5 V pin
31	4 or 8	DCD	Input	RxD+	Input
32	4 or 8	DSR	Input	reserved	Input
33	4 or 8	RxD	Input	RxD-	Input
34	4 or 8	RTS	Output	reserved	Output
35	4 or 8	TxD	Output	TxD+	Output
36	4 or 8	CTS	Input	reserved	Input
37	4 or 8	DTR	Output	TxD-	Output
38	4 or 8	RI	Input	reserved	Output
39	4 or 8	SGND	Signal GND	SR	Signal reference
40	4 or 8	5 V	5 V pin	5 V	5 V pin

B4   Ribbon cables and sub-D connectors

The ME-90 PC/104 package includes 2 ribbon cables on 4x 9-pole D-sub connectors. These are assigned as shown below:

One 5 V pin per port
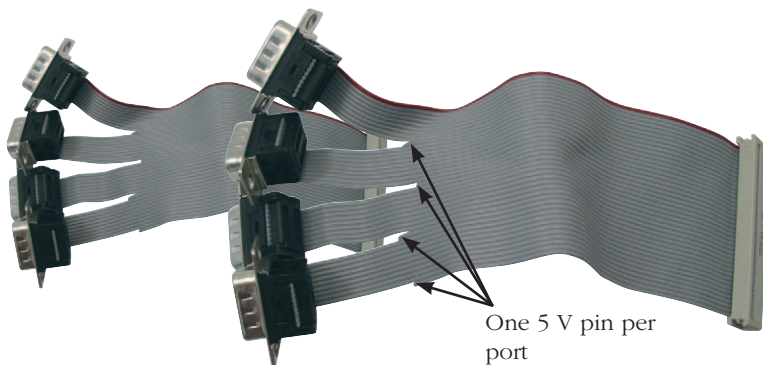
B4.1   9-pole D-sub male connector for RS232 ports
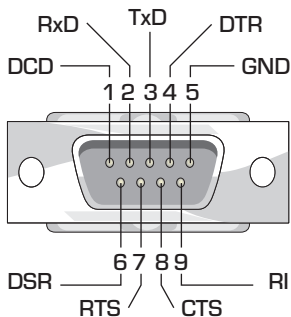
B4.2   9-pole D-sub male connector for RS422/RS485 ports
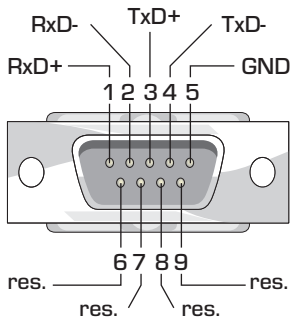
Figures 9a - c: Ribbon cable and 9-pole sub-D connector

C   Technical Questions

C1   Fax hotline

If you have technical questions or problems relating to the board, please send a detailed description of the problem to our hotline:

Fax hotline:

within Germany: (089) 89 01 66-28
from abroad: ++49 - 89 - 89 01 66-28

Email hotline:

support@meilhaus.com

C2   Customer service address

We hope that you will never need this part of the manual. If your board has a technical defect, please contact us at:

Meilhaus Electronic GmbH

Abteilung Reparaturen
Fischerstrasse 2
D-82178 Puchheim, Germany

If you want to return your board for repair, please enclose a detailed description of the error including details of your computer/system and the software used! The simplest method is to use our **RMA procedure** which you will find online at

www.meilhaus.com/en/service/rma-procedure/

C3   Updates

The current drivers for Meilhaus Electronic boards and our manuals in PDF format are available from **www.meilhaus.de**

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